

REMARKS

In view of the above amendments and the following remarks, reconsideration and further examination of the amended application are respectfully requested.

Claims 1 - 11 are currently pending. Claims 1-2 and 4-7 have been canceled without prejudice or disclaimer to the material contained therein. Claim 3 has been modified to more accurately describe the subject matter of the current application. Claims 8-11 have been added. All claims are fully supported by the Specification and it is believed that no new matter is submitted.

With regard to the amendment and following remarks, the Applicant respectfully request reconsideration of the reasons for rejection.

§103(a) Rejection 1 (Item 2 of Office Action)

Claim 3 was rejected under 35 U.S.C. §103(a) as being unpatentable over Applicant's admitted prior art on pages 1 and 2, paragraphs 2-4, of the instant application, in view of Edelmayer et al. (US Patent No. 5,758,613).

All limitations must be taught

The Examiner argues on page 4 of the response that US Pat. No. '613 teaches a valve seat with an arcuate face. However, Edelmayer et al does not teach, suggest, or imply the use of a silicon check valve as currently claimed in amended independent claim 3 and added independent claim 11. Edelmayer et al. does not specifically mention the material of the check ball, at most stating in Col. 5, lines 65-67, "Any check valve element which can be used in conjunction with a sealed leakdown lash adjuster can also be utilized with the present invention."

However, since Edelmayer et al. is silent on the material of the check ball and none of the references, either alone or in combination with Edelmayer et al., teaches a silicon nitride ceramic check ball, the Applicant respectfully asserts the amended claims are not made obvious by Edelmayer et al. and Applicant's admitted prior art. The reason for the Applicant's position is due at least in part to MPEP §2143 and specifically MPEP §2143.03: all claim limitations must be taught or suggested in order to form a *prima facie* §103 rejection.

Modification cannot go against principle of operation

In addition, Edelmayer et al. effectively teaches against the biasing of the check ball in the closing direction as further claimed in amended independent claim 3 and added independent claim 11. Instead, Edelmayer et al. teaches the biasing of the check ball in the opening direction.

Therefore, using Edelmayer et al. in a modification in which the biasing of the check ball in the opening direction is reversed and subsequently biased in a closing direction would alter the principle of operation of Edelmayer et al. This is contrary to MPEP §2143.01, page 2100-132: the proposed modification cannot change the principle of operation of a reference.

A declared object of the '613 patent is to "provide an improved hydraulic lash adjuster of the sealed leakdown type which makes it feasible to fill the lash adjuster with hydraulic fluid prior to assembly into the engine." (Col. 2, lines 63-67). Filling the lash adjuster of the current application with hydraulic fluid prior to assembly into the engine would result in the assembly process being nearly possible (according to teachings in Edelmayer et al. Col. 2, lines 25-44), and primarily due to the biasing of the check ball in the closing direction. This is directly contrary to the principle of operation of the teachings of the Edelmayer et al. reference.

Consequently, using the Edelmayer et al. reference would require fundamental alteration of some of the principles of operation of the reference. Therefore, the Applicant respectfully requests that the Edelmayer et al. reference be withdrawn in accordance with MPEP §2143.01, along with the corresponding withdrawal of the §103 rejection, for at least these reasons.

§103(a) Rejection 2 (Item 3 of Office Action)

Claims 4 and 6 were rejected under 35 U.S.C. §103(a) as being unpatentable over Applicant's admitted prior art on pages 1 and 2, paragraphs 2-4, of the instant application, in view of Edelmayer et al. (US Patent No. 5,758,613), and further in view of Abu et al. (Japanese Patent 58-178812).

Edelmayer et al. arguments for previous §103(a) rejection

The limitations of claim 6 have been incorporated into amended independent claim 3 and added independent claim 11. As a result, the office action rejection of canceled dependent claim

6 is discussed in the context of independent claims 3 and 11 as in the previous §103(a) rejection. Dependent claim 4 has been canceled and the rejection of claim 4 is therefore moot.

The arguments against the appropriateness of Edelmayer et al. made with respect to the previous §103(a) rejection remain valid and pertinent and are hereby repeated in view of the new combination of cited references particular to the instant §103(a) rejection.

Edelmayer et al. and Abu et al.

In addition, Abu et al., either alone or in combination with the Edelmayer et al. and the Applicant's admitted prior art, does not completely meet the claims of the current application. Abu et al. merely teaches the use of a ceramic check ball, not the silicon nitride ceramic material as claimed by the current application in independent claims 3 and 11.

The arcuate valve seat face identified by the Examiner on page 4 of the office action is actually a concave and arcuate valve seat face (most clearly viewed in FIG. 2), not the convex and arcuate valve seat face as claimed by the current application.

Furthermore, the check ball of Abu et al. is taught as freely fluctuating between a closed and an opened state. There is no biasing in either direction.

Consequently, Abu et al., in combination with Edelmayer et al. and the Applicant's admitted prior art, does not teach, imply or suggest all of the limitations and elements of the claims. The Applicant respectfully requests reconsideration of the §103(a) rejection.

§103(a) Rejection 3 (Item 4 of Office Action)

Claim 5 was rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art on pages 1 and 2, paragraphs 2-4, of the instant application, in view of Edelmayer et al., and further in view of Taniguchi et al. (U.S. Patent 5,185,923).

Edelmayer et al. arguments for previous §103(a) rejection

The limitations of claim 5 have been incorporated into amended independent claim 3 and added independent claim 11. As a result, the office action rejection of canceled dependent claim 5 is discussed in the context of independent claims 3 and 11 as with the previous §103(a) rejections.

The arguments against the appropriateness of Edelmayer et al. made with respect to the previous §103(a) rejection remain valid and pertinent and are hereby repeated in view of the new combination of cited references particular to the instant §103(a) rejection.

Edelmayer et al. and Taniguchi

Taniguchi is cited as teaching “a tappet 400 containing a semi-spherical ceramic portion made of silicon nitride (column 4, lines 15-33).” The Applicant respectfully traverses the Examiner’s arguments for at least the reasons listed below.

No Suggestion or Motivation to Combine

The Applicant respectfully states that Taniguchi is improperly used in this rejection due to the lack of a suggestion or motivation to combine this reference with the other information cited by the Examiner. MPEP §2143.01 provides three sources able to provide a suggestion or motivation; 1. the nature of the problems to be solved, 2. the teachings of the references, or 3. the knowledge of persons of ordinary skill in the art.

The first source addresses the nature of the problem to be solved. The Applicant has previously and consistently stated that the nature of a problem of finding a material able to provide friction resistance in a rapidly rotating valve train is not the same as the nature of a problem of finding a lightweight material capable of successively sealing against a valve face. In none of the examples shown in Taniguchi is the material taught, suggested, or implied as being appropriate for use as a check ball or in any type of sealing application. Therefore, the Applicant respectfully asserts that there is no suggestion or motivation to combine Taniguchi based upon the nature of the problem to be solved.

The second source of motivation addresses the teachings of the references themselves. The Applicant acknowledges that instead of an explicit teaching in Taniguchi suggesting the use of the material in a fundamentally different manner, there can be an implied or inherent teaching of the advantages of the material in the modified application. However, in this case there is no implied or inherent teaching of a suggestion or motivation to combine. The material is only taught in terms of advantages when used for friction wear surfaces, not when used for sealing

applications. Therefore it would be unlikely that a person of skill in the art would use the teachings of Taniguchi in a search for an improved check ball material.

The third source of suggestion or motivation to combine is in the knowledge of a person of ordinary skill in the art. The Applicant respectfully states that there are fundamental differences between the knowledge required for the design of a hydraulic system as opposed to the knowledge required for the design of a frictional mechanical linkage system. There is no evidence suggested by the Examiner that the use of the silicon nitride material is within the knowledge of one of average skill in the art of hydraulic lash adjuster design.

If the Examiner is relying upon scientific theory or “common knowledge” in the art, the Applicant respectfully requests secondary documentary evidence supporting this decision so that the Applicant can properly respond to the Examiner’s position. In lieu of this and for at least the other reasons given, the Applicant respectfully requests that the combination of Taniguchi with the other references be reconsidered and that the §103(a) rejection for claims 3 and 11 be withdrawn.

All claim limitations must be taught

Regardless of the lack of suggestion or motivation to combine, the Taniguchi reference fails to teach, imply, or suggest all of the limitations of independent claim 11, and dependent claims 8 and 9. These claims contain further limitations of material properties not identified or taught by the Taniguchi reference.

In particular, claim 8 further limits the ceramic containing silicon nitride of claim 3 to a hardness value of at least 1500 [HV]. Claim 9 also further limits the ceramic containing silicon nitride of claim 3 to a heat resistant temperature of at least 800 °C. Independent claim 11 limits the ceramic containing silicon nitride to a material containing a combination of the limitations from claims 8 and 9.

For at least these reasons, Taniguchi fails to teach all of the limitation of these claims. The Applicant respectfully requests reconsideration and withdrawal of this §103(a) rejection.

In view of the above amendments and remarks, reconsideration of the rejections contained in the Office Action of June 22, 2005, is respectfully requested. Since claims 8-10 depend upon

amended independent claim 3, allowance of independent claim 3 would result in allowance of claims 8-10.

The current amendments are believed to place the application in a condition for immediate allowance. However, if the Examiner has any additional suggestions or considerations that may place the application in a condition for immediate allowance, he should contact the Applicants' representative at the phone number listed below.

Respectfully submitted,

Hiroki FUJII et al.

By: 

Nils E. Pedersen
Registration No. 33,145
Attorney for Applicants

NEP/krq
Washington, D.C. 20006-1021
Telephone (202) 721-8200
Facsimile (202) 721-8250
September 22, 2005